

SEQUENCE LISTING

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ZENG, WEIGUANG

<120> NOVEL IMMUNOGENIC LIPOPEPTIDES COMPRISING T-HELPER
AND B-CELL EPITOPES

<130> 25229-09966/US

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<141> 2005-02-14

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<151> 2003-08-12

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<160> 115

<170> PatentIn Ver. 3.3

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Peptide

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1 5 10 15

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<400> 2
Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
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<400> 3
His Trp Ser Tyr Gly Leu Arg Pro Gly
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Gly Leu Arg Pro Gly
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<400> 5
Gly Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser
1 5 10 15

Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
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Glu His Trp Ser Tyr Gly Leu Arg Pro Gly Gly Ala Leu Asn Asn Arg
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Phe Gln Ile Lys Gly Val Glu Leu Lys Ser
20 25

<210> 7

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<400> 7
Gly Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser
1 5 10 15

Lys Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
20 25

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Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser
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1 5 10 15

Leu Lys His Trp Ser Tyr Gly Leu Arg Pro Gly
20 25

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<400> 10
Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu Asn Ser Val Leu Glu Pro
1 5 10 15

Ile Lys Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
20 25

<210> 11
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Peptide

<400> 11
Thr Ala Ala Gln Ile Thr Ala Gly Ile Ala Leu His Gln Ser Asn Leu
1 5 10 15

Asn Lys Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
20 25

<210> 12
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Peptide

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Pro Arg Tyr Ile Ala Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu
1 5 10 15

Ser Lys Glu His Trp Ser Tyr Gly Leu Arg Pro Gly
20 25

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Peptide

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1 5 10 15

Leu Lys Gly Leu Arg Pro Gly
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Peptide

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1 5 10 15
Ile Lys Gly Leu Arg Pro Gly
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<400> 15
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1 5 10 15
Asn Lys Gly Leu Arg Pro Gly
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Peptide

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Ser Lys Gly Leu Arg Pro Gly
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Asn

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Peptide

<400> 21
Ile Gly Thr Asp Asn Val His Tyr Lys Ile Met Thr Arg Pro Ser His
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Gln

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Peptide

<400> 22
Tyr Lys Ile Met Thr Arg Pro Ser His Gln Tyr Leu Val Ile Lys Leu
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Ile

<210> 23
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Peptide

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1 5 10 15

Glu

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Peptide

<400> 24
Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu

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5

10

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Leu

<210> 25

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<400> 25

Leu Ile Glu Asn Cys Thr Lys Ala Glu Leu Gly Glu Tyr Glu Lys Leu
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Leu

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<400> 26

Ala Glu Leu Gly Glu Tyr Glu Lys Leu Leu Asn Ser Val Leu Glu Pro
1 5 10 15

Ile

<210> 27

<211> 17

<212> PRT

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<400> 27

Lys Leu Leu Asn Ser Val Leu Glu Pro Ile Asn Gln Ala Leu Thr Leu
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Met

<210> 28

<211> 17
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<400> 28
Glu Pro Ile Asn Gln Ala Leu Thr Leu Met Thr Lys Asn Val Lys Pro
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Leu

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<400> 29
Thr Leu Met Thr Lys Asn Val Lys Pro Leu Gln Ser Leu Gly Ser Gly
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Arg

<210> 30
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<400> 30
Lys Pro Leu Gln Ser Leu Gly Ser Gly Arg Arg Gln Arg Arg Phe Ala
1 5 10 15

Gly

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<400> 31
Ser Gly Arg Arg Gln Arg Arg Phe Ala Gly Val Val Leu Ala Gly Val
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Ala

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Peptide

<400> 32
Phe Ala Gly Val Val Leu Ala Gly Val Ala Leu Gly Val Ala Thr Ala
1 5 10 15

Ala

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Peptide

<400> 33
Gly Val Ala Leu Gly Val Ala Thr Ala Ala Gln Ile Thr Ala Gly Ile
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Ala

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1 5 10 15

Leu

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Peptide

<400> 35
Asn Leu Asn Ala Gln Ala Ile Gln Ser Leu Arg Thr Ser Leu Glu Gln
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Ser

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Peptide

<400> 36
Gln Ser Leu Arg Thr Ser Leu Glu Gln Ser Asn Lys Ala Ile Glu Glu
1 5 10 15

Ile

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Peptide

<400> 37
Glu Gln Ser Asn Lys Ala Ile Glu Glu Ile Arg Glu Ala Thr Gln Glu
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Thr

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Peptide

<400> 38
Ser Ser Lys Thr Gln Thr His Thr Gln Gln Asp Arg Pro Pro Gln Pro
1 5 10 15

Ser

<210> 39
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Peptide

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Gln Pro Ser Thr Glu Leu Glu Glu Thr Arg Thr Ser Arg Ala Arg His
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Ser

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Peptide

<400> 40
Arg His Ser Thr Thr Ser Ala Gln Arg Ser Thr His Tyr Asp Pro Arg
1 5 10 15

Thr

<210> 41
<211> 17
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<220>
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Peptide

<400> 41
Pro Arg Thr Ser Asp Arg Pro Val Ser Tyr Thr Met Asn Arg Thr Arg
1 5 10 15

Ser

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<220>
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<400> 42
Thr Arg Ser Arg Lys Gln Thr Ser His Arg Leu Lys Asn Ile Pro Val
1 5 10 15

His

<210> 43
<211> 17
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<400> 43
Thr Glu Leu Leu Ser Ile Phe Gly Pro Ser Leu Arg Asp Pro Ile Ser
1 5 10 15

Ala

<210> 44
<211> 17
<212> PRT
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<400> 44
Pro Arg Tyr Ile Ala Thr Asn Gly Tyr Leu Ile Ser Asn Phe Asp Glu
1 5 10 15

Ser

<210> 45
<211> 17

<212> PRT
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Peptide

<400> 45
Cys Ile Arg Gly Asp Thr Ser Ser Cys Ala Arg Thr Leu Val Ser Gly
1 5 10 15

Thr

<210> 46
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Asp Glu Ser Ser Cys Val Phe Val Ser Glu Ser Ala Ile Cys Ser Gln
1 5 10 15

Asn

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Peptide

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Thr Ser Thr Ile Ile Asn Gln Ser Pro Asp Lys Leu Leu Thr Phe Ile
1 5 10 15

Ala

<210> 48
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Peptide

<400> 48
Ser Pro Asp Lys Leu Leu Thr Phe Ile Ala Ser Asp Thr Cys Pro Leu
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Val

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Peptide

<400> 49
Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg
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Ala Pro Gly Ser Thr Ala Pro Pro
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Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
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Ser Ser Leu

<210> 51
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Peptide

<400> 51
Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr Ala
1 5 10 15

Ser Leu

<210> 52
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1 5 10 15

Ala Pro Gly Ser Thr Ala Pro Pro Lys Lys Gly
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<210> 53
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Ser Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg
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Pro Ala Pro Gly Ser Thr Ala Pro Pro Lys
20 25

<210> 54
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Gly Val Ala Glu
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<400> 55
Thr Ala Ser Gly Val Ala Glu Thr Thr Asn
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<210> 56
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Thr Ala Lys Ser Lys Lys Phe Pro Ser Tyr Thr Ala Thr Tyr Gln Phe
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<212> PRT
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Glu Ala Glu Glu Ala Ala Arg Leu Gln Ala
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<210> 58
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Phe Arg Glu Arg Thr Leu Thr Gly Gln Arg Ala Cys Asn Asp Val Asn
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Ser Glu

<210> 59
<211> 18
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<400> 59
Asn Pro Leu Glu Thr Ser Gly Ala Ser Thr Val Gly Phe Arg Glu Arg
1 5 10 15

Thr Leu

<210> 60
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Peptide

<400> 60
Ile Arg Glu Thr Arg Lys Arg Gln Lys Met Val Asp Asp Ala Val Asn
1 5 10 15

Glu Tyr

<210> 61
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Peptide

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Ala Lys Ala Pro Val Val Lys Glu Gly Pro Tyr Glu Gly Pro Val Lys
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Lys Pro Val

<210> 62
<211> 19
<212> PRT
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Peptide

<400> 62
Ala Gly Pro Leu Glu Arg Gln Lys Pro Leu Lys Val Lys Ala Lys Ala
1 5 10 15

Pro Val Val

<210> 63
 <211> 19
 <212> PRT
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<400> 63
 Lys Val Arg Ala Lys Leu Pro Gln Gln Glu Gly Pro Tyr Ala Gly Pro
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 Leu Glu Arg

<210> 64
 <211> 19
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<400> 64
 Gly Pro Tyr Thr Gly Pro Leu Glu Arg Gln Arg Pro Leu Lys Val Arg
 1 5 10 15
 Ala Lys Leu

<210> 65
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<400> 65
 Val Gly Arg Leu Ile Phe Ser Gly Glu Ala Leu Thr Tyr Lys Asp Ile
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Val Val

<210> 66
 <211> 19
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<220>
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Peptide

<400> 66
Thr Lys His Phe Arg Asp Thr Ala Arg Met Lys Lys Gly Thr Pro Val
1 5 10 15

Val Gly Val

<210> 67
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Peptide

<400> 67
Ser Gly Ala Pro Pro Thr Asp Leu Gln Lys Met Val Met Gly Asn Thr
1 5 10 15

Lys Pro Val

<210> 68
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
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Peptide

<400> 68
Asn Lys Tyr Ser Ala Ser Gly Ser Gly Val Arg Gly Asp Phe Gly Ser
1 5 10 15

Leu Ala Pro Arg Val Ala Arg Gln Leu Pro Ala Ser Phe Asn Tyr Gly
20 25 30

Ala Ile Lys
35

<210> 69
<211> 20
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Peptide

<400> 69
Leu Tyr Thr Lys Val Val His Tyr Arg Lys Trp Ile Lys Asp Thr Ile
1 5 10 15

Val Ala Asn Pro
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<210> 70
<211> 19
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Peptide

<400> 70
Ala Val Lys Val Met Asp Leu Pro Gln Glu Pro Ala Leu Gly Thr Thr
1 5 10 15

Cys Tyr Ala

<210> 71
<211> 20
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Peptide

<400> 71
Ile Val Gly Gly Trp Glu Cys Glu Lys His Ser Gln Pro Trp Gln Val
1 5 10 15

Leu Val Ala Ser
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<210> 72
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Peptide

<400> 72
Cys Ala Gln Val His Pro Gln Lys Val Thr Lys Phe Met Leu
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<210> 73
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<212> PRT
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Peptide

<400> 73
Tyr Leu Met Leu Leu Arg Leu Ser Glu Pro Ala Glu Leu Thr Asp Asp
1 5 10 15
Ala Val Lys Val Met
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<210> 74
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Peptide

<400> 74
Leu Leu Lys Asn Arg Phe Leu Arg Pro Gly Asp Asp Ser Ser His Asp
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Leu Met Leu Leu Tyr
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<210> 75
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Peptide

<400> 75
Ile Leu Leu Gly Arg His Ser Leu Phe His Pro Glu Asp Thr Gly Gln
1 5 10 15
Val Phe Gln Val Tyr
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<210> 76
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Peptide

<400> 76
Thr Cys Asp Asp Pro Arg Phe Gln Asp Ser Ser Ser Ser Lys Ala Pro
1 5 10 15

Pro Pro Ser Leu Pro Ser Pro Ser Arg Leu Pro Gly Pro Ser Asp Thr
20 25 30

Pro Ile Leu Pro Gln
35

<210> 77
<211> 17
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Peptide

<400> 77
Cys Gln Asp Ser Lys Val Thr Glu Ile Pro Thr Leu Pro Arg Asn Ala
1 5 10 15

Ile

<210> 78
<211> 19
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Peptide

<400> 78
Asn Lys Gly Asp Cys Gly Thr Pro Ser His Ser Arg Arg Gln Pro His
1 5 10 15

Val Met Ser

<210> 79
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Peptide

<400> 79
Trp Leu Cys Phe Pro Leu Cys Leu Ala Leu Pro
1 5 10

<210> 80
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<400> 80
Leu Gly Gly Leu Tyr Cys Gly Pro Ser Ser Phe
1 5 10

<210> 81
<211> 12
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<400> 81
Gly Ser Ile Thr Arg Asp Ser Ile Phe Arg Leu Arg
1 5 10

<210> 82
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<400> 82
Ser Ala Leu Pro Val Asn Ile Gln Val Phe Thr Leu
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<210> 83
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<400> 83
Glu Leu Gln Ile Ala Lys Asp Glu Arg Tyr Gly Ser
1 5 10

<210> 84

<211> 12
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<400> 84
Val Lys Leu Leu Arg Glu Pro Ile Tyr Val Glu Val
1 5 10

<210> 85
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<400> 85
Pro Pro Ala Gln Tyr Ser Trp Leu Ile Asp Gly Asn
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<210> 86
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<400> 86
Ala Asn Ala Ser Gln Thr Asp Asn Gly Val Asn Arg Ser Gly Ser Glu
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Asp Pro Thr Val
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<210> 87
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<400> 87
Pro Glu Thr Lys His Pro Lys Lys Gly Val Glu Lys Tyr Gly Pro Glu
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Ala Ser Ala Phe

<210> 88
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Peptide

<400> 88
Leu Val Leu Leu Asp Tyr Gln Gly Met Leu Pro Val Cys Pro Leu
1 5 10 15

<210> 89
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Peptide

<400> 89
Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser
1 5 10 15

<210> 90
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Peptide

<400> 90
Met Gln Trp Asn Ser Thr Thr Phe His Gln Ala Leu Leu
1 5 10

<210> 91
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Peptide

<400> 91
Ala Ala Phe Glu Asp Leu Arg Val Ser Ser Phe Ile Arg Gly Thr
1 5 10 15

<210> 92
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 <223> Description of Artificial Sequence: Synthetic
 Peptide

 <400> 92
 Ser Asn Glu Asn Met Glu Thr Met Asp Ser Ser Thr Leu Glu
 1 5 10

<210> 93
 <211> 19
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Peptide

 <400> 93
 His Pro Leu Ile Leu Asp Thr Cys Thr Ile Glu Gly Leu Ile Tyr Gly
 1 5 10 15

 Asn Pro Ser

<210> 94
 <211> 10
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Peptide

 <400> 94
 Tyr Gln Arg Ile Gln Ile Phe Pro Asp Thr
 1 5 10

<210> 95
 <211> 18
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: Synthetic
 Peptide

 <400> 95
 Ile Gln Ile Phe Pro Asp Thr Ile Trp Asn Val Ser Tyr Ser Gly Thr
 1 5 10 15

Ser Lys

<210> 96
 <211> 38
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic Peptide

<400> 96
 Cys Lys Tyr Ser Ala Ser Gly Ser Gly Val Arg Gly Asp Phe Gly Ser
 1 5 10 15

Leu Ala Pro Arg Val Ala Arg Cys Leu Pro Ala Ser Phe Asn Thr Gly
 20 25 30

Ala Ile Lys Asn Lys Tyr
 35

<210> 97
 <211> 13
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic Peptide

<400> 97
 Glu Gln Gln Trp Asn Phe Ala Gly Ile Glu Ala Ala Ala
 1 5 10

<210> 98
 <211> 23
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic Peptide

<400> 98
 Ala Ala Ala Trp Gly Gly Ser Gly Ser Glu Ala Tyr Gln Gly Val Gln
 1 5 10 15

Gln Lys Trp Asp Ala Thr Ala
 20

<210> 99
 <211> 29

<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 99
Gly Gly Pro Thr Arg Thr Ile Gly Gly Ser Gln Ala Gln Thr Ala Ser
1 5 10 15

Gly Leu Val Ser Met Phe Ser Val Gly Pro Ser Gln Lys
20 25

<210> 100
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 100
Lys Phe Gln Asp Ala Tyr Asn Ala Ala Gly Gly His
1 5 10

<210> 101
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 101
Lys Gln Ala Glu Asp Lys Val Lys Ala Ser Arg Glu Ala Lys Lys Gln
1 5 10 15

Val Glu Lys Ala Leu Glu Gln Leu Glu Asp Lys Val Lys
20 25

<210> 102
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 102
Gly Trp Met Asp Phe
1 5

<210> 103

<211> 26

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 103

Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu
1 5 10 15

Leu His Trp Ser Tyr Gly Leu Arg Pro Gly
20 25

<210> 104

<211> 22

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 104

Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu
1 5 10 15

Leu Gly Leu Arg Pro Gly
20

<210> 105

<211> 46

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 105

Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu
1 5 10 15

Leu Lys Gln Ala Glu Asp Lys Val Lys Ala Ser Arg Glu Ala Lys Lys
20 25 30

Gln Val Glu Lys Ala Leu Glu Gln Leu Glu Asp Lys Val Lys
35 40 45

<210> 106

<211> 47

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 106

Lys	Leu	Ile	Pro	Asn	Ala	Ser	Leu	Ile	Glu	Asn	Cys	Thr	Lys	Ala	Glu
1															15

Leu	Lys	Lys	Gln	Ala	Glu	Asp	Lys	Val	Lys	Ala	Ser	Arg	Glu	Ala	Lys
															30
	20						25								

Lys	Gln	Val	Glu	Lys	Ala	Leu	Glu	Gln	Leu	Glu	Asp	Lys	Val	Lys
	35					40						45		

<210> 107

<211> 45

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 107

Gly	Ala	Leu	Asn	Asn	Arg	Phe	Gln	Ile	Lys	Gly	Val	Glu	Leu	Lys	Ser
1															15

Lys	Gln	Ala	Glu	Asp	Lys	Val	Lys	Ala	Ser	Arg	Glu	Ala	Lys	Lys	Gln
															30
	20						25								

Val	Glu	Lys	Ala	Leu	Glu	Gln	Leu	Glu	Asp	Lys	Val	Lys		
	35				40						45			

<210> 108

<211> 46

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 108

Gly	Ala	Leu	Asn	Asn	Arg	Phe	Gln	Ile	Lys	Gly	Val	Glu	Leu	Lys	Ser
1															15

Lys	Lys	Gln	Ala	Glu	Asp	Lys	Val	Lys	Ala	Ser	Arg	Glu	Ala	Lys	Lys
															30
	20						25								

Gln	Val	Glu	Lys	Ala	Leu	Glu	Gln	Leu	Glu	Asp	Lys	Val	Lys	
	35				40						45			

<210> 109
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 109
Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu
1 5 10 15

Leu Gly Trp Met Asp Phe
20

<210> 110
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 110
Lys Leu Ile Pro Asn Ala Ser Leu Ile Glu Asn Cys Thr Lys Ala Glu
1 5 10 15

Leu Lys Gly Trp Met Asp Phe
20

<210> 111
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 111
Gly Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser
1 5 10 15

Gly Trp Met Asp Phe
20

<210> 112
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic

Peptide

<400> 112
 Gly Ala Leu Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser
 1 5 10 15
 Lys Gly Trp Met Asp Phe
 20

<210> 113
 <211> 17
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Peptide

<400> 113
 Glu Gly Pro Trp Leu Glu Glu Glu Glu Ala Tyr Gly Trp Met Asp
 1 5 10 15

Phe

<210> 114
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Peptide

<220>
 <221> MOD_RES
 <222> (1)
 <223> Pam3Cys

<400> 114
 Cys Ser Lys Lys Lys Lys
 1 5

<210> 115
 <211> 6
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Synthetic
 Peptide

<400> 115
 Lys Gly Leu Arg Pro Gly
 1 5

